



EQUIPMENT WEIGHTS
EATON COOPER POWER SYSTEMS VR32 200A REGULATOR (PER UNIT) 1157kg

ITEM	DESCRIPTION	DRG No	STOCK CODE	QTY	
102	EARTH - PARKING DEVICE, PC CC TO EPD (ENSTO REF. SLW20A2) (SEE NOTE 17)		186905	3	
101	KIT - HEATSHRINK TERMINATION, FOR HV DROPPER LUGS (SEE NOTE 16)		152027	1	
100	ANTENNA - COMMUNICATIONS (SEE NOTE 18)				
99	CABLE - COAXIAL, COMMUNICATIONS (WHERE REQUIRED FOR COMMUNICATIONS INSTALL)		AR		
98	WASHER - SPRING, M12 GALVANISED	518082	175697	2	
97	NUT - M10, HEX, STAINLESS STEEL	515467	103601	24	
96	WASHER - SPRING, M10 STAINLESS STEEL	518082	01020	24	
95	WASHER - FLAT, M10, STAINLESS STEEL	518081	49411	48	
94	SCREW - SET, M10x30mm, HEX, STAINLESS STEEL	515467	45088	24	
93	NUT - M10, HEX, STAINLESS STEEL	515467	8867	16	
92	WASHER - SPRING, M12 STAINLESS STEEL	518082	143059	16	
91	WASHER - FLAT, M12 STAINLESS STEEL	518081	49429	32	
90	SCREW - SET, M12x30mm, HEX, STAINLESS STEEL	515467	43828	16	
89	NUT - M8, NYLOC, HEX, STAINLESS STEEL	518082	177122	3	
88	NUT - M8, HEX, STAINLESS STEEL	515467	179758	2	
87	WASHER - SPRING, M8, STAINLESS STEEL	518082	96149	4	
86	WASHER - FLAT, M8, STAINLESS STEEL	518081	106201	12	
85	SCREW - SET, M8x40mm, HEX, STAINLESS STEEL	515467	43813	7	
84	WASHER - FLAT, M8 GALVANISED	518081	177982	27	
83	WASHER - CONICAL, M12 GALVANISED	518082	106639	13	
82	BOLT & NUT - M12x130mm, HEX, GALVANISED	515466	48855	10	
81	BOLT & NUT - M12x100mm, HEX, GALVANISED	515467	48888	2	
80	WASHER - FLAT, M18 GALVANISED	518081	177984	3	
79	WASHER - CONICAL, M18 GALVANISED	518082	106647	11	
78	WASHER - SQUARE, 50x50x6mm, GALVANISED (Ø18mm HOLE)	518081	106257	3	
77	WASHER - M8, GALVANISED (TO SUIT POLE SIZE) (C/W 4 NUTS & WASHERS)	514459	106257	4	
76	BOLT & NUT - M16x200mm, HEX, GALVANISED	515466	83721	3	
75	EYE-BOLT - M20 GALVANISED (LENGTH TO SUIT POLES) (SEE NOTE 19)	513651	106863	1	
74	WASHER - FLAT, M20 GALVANISED	518081	177989	9	
73	WASHER - CONICAL, M20 GALVANISED (Ø22mm HOLE)	518082	106655	5	
72	WASHER - SQUARE, 75x75x6mm, GALVANISED (Ø22mm HOLE)	518081	106231	6	
71	EYE-BOLT - M20x20mm, GALVANISED (SEE NOTES 18 & 19)	513653	106781	4	
70	EYE-BOLT - M20 GALVANISED (LENGTH TO SUIT POLES) (SEE NOTE 19)	513651	106863	1	
69	BOLT & NUT - M20, HEX, GALVANISED (LENGTH TO SUIT POLE)	515466	106671	2	
68	WASHER - SPRING, M20 GALVANISED (TO A.S. 1111)		PURCHASE	6	
67	WASHER - FLAT, M20 GALVANISED	518081	177981	26	
66	WASHER - CONICAL, M20 GALVANISED (Ø22mm HOLE)	518082	106663	5	
65	WASHER - SQUARE, 75x75x6mm, GALVANISED (Ø22mm HOLE)	518081	106273	11	
64	WASHER - LIP, M20 GALVANISED	518081	17892	3	
63	BOLT & NUT - M24x45mm, HEX, GALVANISED (TO A.S. 1111)		PURCHASE	4	
62	BOLT & NUT - M24x90mm, HEX, GALVANISED (TO A.S. 1111)		PURCHASE	2	
61	BOLT & NUT - M24, HEX, GALVANISED (LENGTH TO SUIT POLE)	515465	10665	5	
60	SCREW - COACH, M12x100mm, GALVANISED	106654	AR		
59	SCREW - M20x20mm, SELF-DRIVING	175697	AR		
58	FACE - CHARACTER, 50mm ALUMINIUM, BLACK ON YELLOW (SEE NOTE 10)		PURCHASE	AR	
57	SIGN - DANGER HIGH VOLTAGE (SEE NOTE 11)		140712	2	
56	BEND - 100mm, 90° HIGH IMPACT, ABS (ABS80cm)		PURCHASE	1	
55	SADDLE - CABLE, 12.7mm, HEAVY DUTY, DOUBLE SIDED, GALVANISED		176494	AR	
54	SADDLE - CONDUIT, 40mm, HEAVY DUTY, DOUBLE SIDED, GALVANISED		106676	AR	
53	SADDLE - CONDUIT, 100mm, HEAVY DUTY, DOUBLE SIDED, GALVANISED		106676	AR	
52	CONDUIT - 40mm, HIGH IMPACT, ABS (ABS80cm)		PURCHASE	AR	
51	CONDUIT - 100mm, HIGH IMPACT, ABS (ABS80cm)		PURCHASE	AR	
50	COVER - CABLE, PROTECTOR, 150mm WIDE (SEE NOTE 14)		151084	AR	
49	GUARD - EARTH, COVER, 3m, BLACK, PVC		157522	3	
48	CABLE - CONTROL, 12 CORE, 18m, EXTENSION		181674	2	
47	CONDUCTOR - 11kV CDSX19, 19mm ² , ALUMINIUM, BLACK ON YELLOW (SEE NOTE 4)		186801	AR	
46	CONDUCTOR - 11kV CDSX19, 19mm ² , ALUMINIUM, BLACK ON YELLOW (SEE NOTE 4)		186808	AR	
45	CONDUCTOR - MERCURY, 74 SAAC (SEE NOTE 7)		151433	AR	
44	CONDUCTOR - 192 14/70mm ² COPPER, PVC COVERED, BLACK (SEE NOTE 6)		60111	AR	
43	BRACKET - T-MOUNTING, 11kV POLYMER SURGE ARRESTER		177944	182271	3
42	CAP - CONDUCTOR (ENSTO REF. CS2C11) (TO BE USED FOR CCSX19)		186868	3	
41	CAP - CONDUCTOR (ENSTO REF. CS2C2) (TO BE USED FOR CCSX19)		186867	6	
40	JOINT - NON TENSION, PC TO IPC (ENSTO REF. SLW20A)		186903	6	
39	JOINT - NON TENSION, PC TO BARE (ENSTO REF. SLW20A)		186903	3	
38	CLAMP - PARALLEL GROOVE, 2 BOLT, COPPER		179495	2	
37	LUG - COMPRESSION, BI-METALLIC, M10 HOLE (TO SUIT CCSX22 CONDUCTOR) (SEE NOTE 10)	514053	187342	3	
36	LUG - COMPRESSION, BI-METALLIC, M10 HOLE (TO SUIT CCSX19 CONDUCTOR) (SEE NOTE 10)	514053	187561	6	
35	LUG - COMPRESSION, BI-METALLIC, 2x M10 HOLES (TO SUIT CCSX19 CONDUCTOR) (SEE NOTE 10)	514053	187542	6	
34	LUG - COMPRESSION, TINNED COPPER, M16 HOLE (TO SUIT 70mm ² CABLE)		57877	2	
33	LUG - COMPRESSION, BI-METALLIC, M12 HOLE (TO SUIT MERCURY CONDUCTOR)	514053	187975	2	
32	LUG - COMPRESSION, BI-METALLIC, M12 HOLE (TO SUIT 70mm ² CABLE)		7481	14	
31	LUG - COMPRESSION, BI-METALLIC, INCLINED, 2x M10 HOLES (TO SUIT 14 (70mm ²) CABLE) (SEE NOTE 7)		187132	2	
30	CONNECTOR - COMPRESSION, PROFILE 6, COPPER (70mm ² CONDUCTOR TO Ø16mm ROD)		101899	4	
29	COUPLER - EARTH ELECTRODE, (TO SUIT Ø16mm ROD)		101849	AR	
28	ELECTRODE - DRIVEN EARTH, Ø15x100mm		101831	AR	
27	STRUB - EARTH, MAKEDOWN		520088	100815	2
26	BAR - EARTH, TOP, FLAT, TINNED COPPER, 30x6x3mm (SEE DETAIL 3)		222409	18210	1
25	BAR - EARTH, BOTTOM, FLAT, TINNED COPPER, 30x6x3mm (SEE DETAIL 3)		222406	18210	1
24	ARRESTER - SURGE, 10kV, 10kA, POLYMER DISTRIBUTION TYPE, 12mm TOP & BOTTOM STUB COMPLETE WITH BRIDGES (SEE NOTES 5 & 6)		111948	3	
23	LUG - 120kV, 60 AMP, OUTDOOR		58755	3	
22	CLAMP - LV, SUSPENSION (SEE NOTE 8)		111312	3	
21	PLATE - TWISTED, 170x50mm, GALVANISED		151086	179001	3
20	WIRE - TE, PRE-FORMED, INSULATED (ENSTO REF. S0216157) (TO BE USED FOR CCSX19) (SET OF 6)		186874	3	
19	BRACKET - BOW, 700kV, REF. 705, A.S. 11542		30890	3	
18	COVER - TERMINATION (ENSTO REF. SFR8) (TO BE USED FOR CCSX19) (SET OF 3)		186871	3	
17	CLAMP - TERMINATION, WEDGE, ENSTO REF. S0236, 20 (TO BE USED FOR CCSX19)		186867	3	
16	TONGUE - U-CLEVIS, 700kV, A.S. 11542		187140	3	
15	INSULATOR - 112kV AERODYNAMIC, GZ450 & PIN ARRANGEMENT		513997	8	
14	INSULATOR - LONGROD, 112kV, POLYMER, 70kV (CLEVITONGUE)		153075	6	
13	CONTROLLER - REGULATOR, MULTIPHASE, CL7 (SUPPLIED WITH REGULATOR)		515466	1	
12	BOLT & NUT - M12, HEX, GALVANISED (LENGTH TO SUIT POLES)		513915	1	
11	REGULATOR - VOLTAGE, VR32, 200A, EATON COOPER POWER SERIES		179613	2	
10	FRAME - REGULATOR, MOUNTING (SEE NOTE 2)		181618	FABRICATE	1
9	BRACE - CROSSARM, FLAT, 90mm, GALVANISED		514385	107738	6
8	BLOCK - GAN, ALUMINIUM, 150mm		146290	1	
7	BLOCK - GAN, ALUMINIUM, 100mm		146274	2	
6	CROSSARM - 2700x150x100mm, CROSSARM 3, HARDWOOD		224230	102636	1
5	CROSSARM - 3000x150x100mm, CROSSARM 2, HARDWOOD (SEE NOTE 3)		224230	102630	1
4	CROSSARM - 2700x150x100mm, CROSSARM 1, HARDWOOD		224230	102391	1
3	CONSTRUCTION - 11kV, OVERHEAD, 2+11CCT		174862	200890	1
2	CONSTRUCTION - 11kV, OVERHEAD, 2+11CCT		200890	1	
1	CONSTRUCTION - 11kV, OVERHEAD, 2+11		513915	1	
	FOOTING - TIMBER POLE, ARRANGEMENT 2, CEMENT STABILISED BACKFILL		504726	1	
	POLE - TIMBER (MINIMUM 15.9m ² /12m) (MINIMUM 8.2m EMBEDMENT)		513888	1	

GROUND MOUNTED CONTROL UNITS SHALL BE USED WHERE THE CONTROL UNIT INCLUDING IS NOT LIKELY TO BE ADVERSELY AFFECTED ADVERSE AFFECTS INCLUDE POTENTIAL INTERFERENCE BY LIVESTOCK OR INSTALLATION IN FLOOD PRONE SITES
IN SUCH SITES, POLE MOUNTED CONTROL UNITS MAY BE USED

- NOTES
1. THE MINIMUM 11kV PHASE TO EARTH CLEARANCE IS 200mm. THE MINIMUM 11kV PHASE TO PHASE CLEARANCE IS 280mm.
 2. WHERE BARE LV MAINS EXIST, THEY SHALL BE CONVERTED TO ABC FOR AT LEAST ONE SPAN EITHER SIDE OF THE REGULATOR. IF LV MAINS ARE PRESENT ON THE POLE, THE ABC IS TO BE CONNECTED TO THE REGULATOR MOUNTING FRAME AS PER THE LV ABC TERMINATION POINT DETAILS SHOWN ON THE DRAWING.
 3. THE DROPTOP FUSE CROSSARM SHOULD NOT BE MOUNTED MORE THAN 5m ABOVE GROUND LEVEL. TO ENABLE THE FUSES TO BE OPERATED FROM GROUND LEVEL WITH A LINK STICK IF A GREATER MOUNTING HEIGHT IS REQUIRED TO MAINTAIN CLEARANCES, THE REGIONAL FIELD OPERATING GROUP NEED TO BE CONSULTED.
 4. ALL HV CONNECTIONS ARE TO BE MADE USING THE CCSX CONDUCTOR SPECIFIED WHERE THE CONDUCTOR IS REQUIRED TO BE STRIPPED PRIOR TO TERMINATION, THE ENTIRE STRIPPED LENGTH MUST BE CLEANED & VIGOROUSLY WIRE BRUSHED AND SUITABLE JOINTING COMPOUND APPLIED TO IT IMMEDIATELY.
 5. THE HV CONNECTIONS TO THE ARRESTERS ARE TO BE MADE USING CCSX62 (ITEM 48) AND SHALL HAVE UV STABILISED MASTIC LINED LV HEATSHRINK TUBING SHRUNK OVER THE BARE OF THE LUGS AND THE CABLE ENDS.
 6. HV SURGE ARRESTERS ARE TO BE EARTHED BY DAISY CHAINING AND ELECTRICALLY BONDING TO THE TOP EARTH BAR USING 70mm² PVC INSULATED COPPER CONDUCTOR (ITEM 45).
 7. MERCURY (17/5 AAC) ALUMINIUM CONDUCTOR SHALL BE USED FROM THE BOTTOM EARTH BAR TO 300mm ABOVE GROUND WHERE 70mm² COPPER PVC INSULATED EARTH CONDUCTOR WILL BE EXTENDED FROM BI-METALLIC LINKS TO THE EARTH ELECTRODES.
 8. THE SUSPENSION CLAMP (ITEM 23) MUST PROVIDE A FIRM CONNECTION TO THE HV DROPPER CABLE IF REQUIRED. CONDUIT INSULATORS MAY BE USED TO ACHIEVE AN EFFECTIVE CONNECTION.
 9. REGULATOR (ASSET) NUMBERS IS TO BE INSTALLED ON POLE APPROXIMATELY 3000mm ABOVE GROUND. LOAD LINK NUMBER IS TO BE INSTALLED IN ACCORDANCE WITH NSTS TABLE 4.6 - 'HV & LV LINK SET NUMBER LABELS' APPROXIMATELY 3000mm ABOVE GROUND. THE POLE NUMBER SHALL BE INSTALLED IN ACCORDANCE WITH NSTS (BETWEEN 2400mm & 3000mm ABOVE GROUND).
 10. PHASE LINK LABELS ARE TO BE INSTALLED ADJACENT TO EACH LINK AS SHOWN USING MINIMUM 50mm ALUMINIUM BLACK ON YELLOW CHARACTER TAGS.
 11. DANGER SIGNS ARE TO BE INSTALLED ON BOTH FRONT & REAR OF THE POLE. SIGNS MUST BE BENT AROUND POLE BEFORE SECURING.
 12. A SITE SPECIFIC EARTHING DESIGN IS REQUIRED FOR EACH REGULATOR INSTALLATION.
 13. THE EARTHING SHOWN ON THIS DRAWING IS INDICATIVE ONLY. ADDITIONAL EARTHING MAY BE REQUIRED TO MEET THE EARTHING DESIGN REQUIREMENTS.
 14. ENSURE BURIED EARTH CONDUCTORS ARE CENTRED UNDER CABLE PROTECTION COVER.
 15. A POLE MOUNTED EXTERNAL ANTENNA CAN BE INSTALLED WHERE REQUIRED. THE ACTUAL LOCATION OF THE ANTENNA IS TO BE DETERMINED DURING INSTALLATION OF COMMUNICATION EQUIPMENT. THE LOCATION IS ALWAYS TO COMPLY WITH THE MINIMUM SAFE WORKING DISTANCES SPECIFIED IN AUSTRAS ELECTRICAL SAFETY RULES.
 16. INSTALL MEDIUM WALLED MASTIC LINED BLACK HEATSHRINK OVER THE BARE LUG BARREL AND CABLE INSULATION.
 17. IF EARTH PARKING DEVICES ARE TO BE INSTALLED ON THE CCSX CONDUCTOR USED FOR THE REGULATOR SUPPLY (ITEM 41) THESE ARE NORMALLY LOCATED AT THE NOJA POLE. HOWEVER, IF THE NOJA POLE IS NOT LOCATED WITHIN LINE OF SIGHT OF THE REGULATOR POLE, IF EARTH PARKING DEVICES ARE TO BE INSTALLED ON BOTH ENDS OF THE CCSX CONDUCTOR.
 18. THE LOAD AND DEVIATION ALLOWABLE ON THE OVERHEAD IS TO BE DETERMINED FROM DRG. 52932A.
 19. THE LOAD AND DEVIATION ALLOWABLE ON THE OVERHEAD AND EYENUT ASSEMBLY IS TO BE DETERMINED FROM DRG. 52933.
 20. REFER TO DESIGNER SAFETY REPORT D25/358527 FOR A TYPICAL HAZARDS ASSOCIATED WITH THIS STANDARD CONSTRUCTION.

POLE DEPTH TO BE DETERMINED BY LINE DESIGNER IN ACCORDANCE WITH NS220

AN EARTHING DESIGN MUST BE UNDERTAKEN FOR EACH SITE. THE EARTHING SHOWN ON THIS DRAWING IS INDICATIVE ONLY.

2 UNIT 11kV POLE MOUNTED REGULATOR WITH POLE MOUNTED CONTROL PANEL
CONSTRUCTION DETAIL

SCALE: AS SHOWN
DRAWN: C MABBUTT
CHECKED: P JARVIS
APPROVED: J JARVIS
DATE: 03/11/2011
PROJECT NUMBER: STD

ASSOCIATED DRAWINGS

NO.	DESCRIPTION	DATE
1	11kV POLE MOUNTED VOLTAGE REGULATOR CONTROLLING NOJA TYPE DSMHS RECLOSER	27/3/10
2	11kV POLE MOUNTED VOLTAGE REGULATOR WITH CONTROLLING NOJA TYPE DSMHS RECLOSER	27/3/10
3	EATON COOPER POWER SYSTEMS 100A & 200A POLE MOUNTED REGULATOR MOUNTING FRAME	18/1/18

42 HONEYSUCKLE DRIVE, NEWCASTLE WEST NSW 2300

ITEM DESCRIPTION DRG No STOCK CODE QTY

14 FABRICATE 1

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